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Acrocoelites (Odontobelus) mantanii, a new species of Early Jurassic belemnite from the Toyora Group, Yamaguchi Prefecture, Japan

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山口県豊浦層群から産出した前期ジュラ紀ベレムナイトの1新種 Acrocoelites (Odontobelus) mantanii

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Key words: Acrocoelites (Odontobelus) mantanii sp. nov., belemnite, Ishimachi area, Toarcian (Early Jurassic), Toyora Group.

Introduction and geologic setting

A well-preserved specimen of the new megateuthidine belemnitid species, Acrocoelites (Odontobelus) mantanii, described here comes from a float block of bituminous black shale belonging to the Toyora Group. The group is a thick (attaining 2,800 m) unit made up of Jurassic clastic sediments. Yabe (1920) first used the term "Toyoura" for Mesozoic exposures in the vicinity of the Tabe Basin, Yamaguchi Prefecture, Southwest Japan. Kobayashi (1926, 1931) formally defined this stratum as the Toyora Group and subdivided it into the Higashinagano, Nishinakayama and Utano Formations in ascending order. Subsequently, Matsumoto (1949) provided the latest definition of the group by exclusion of the non-marine unit (the Toyonishi Group). Acrocoelites (Odontobelus) mantanii sp. nov. occurs in talus on the southern flank of the Nishinagano Valley (=locality 1; see Kameya and Niko, 1995, p. 36, fig. 1) in the Ishimachi area, Toyota-chou, Shimonosekishi. On the basis of geographic position of this fossil locality and geologic map (Hirano, 1971) of the adjacent area, Kameya and Niko (1995) suggested that the specimen was derived from the Nishinakayama Formation. The formation is divided into three members, which are, in upward sequence, Na, Nb, and Nc (Tanabe et al., 1982). Lithology of the belemnitid-bearing block is identical with that of the upper part of the Nb Member.

The Toyora Group has been the subject of many biostratigraphic reports (Hayami, 1960; Hirano, 1973; Matsumoto and Ono, 1947; Takahashi, 1973, and others). Consequently, the Sinemurian (early Early Jurassic) to Bathonian (late Middle Jurassic) age of the group was confirmed.

Systematic paleontology

Order Belemnitida von Zittel, 1895 Suborder Belemnitina von Zittel, 1895 Family Belemnitidae d'Orbigny, 1845 Subfamily Megateuthidinae Sachs and Nalnjaeva, 1967 Genus Acrocoelites Lissajous, 1915

短報 Short Note

Shuji Niko and Atsushi Kameya



Fig. 1. Acrocoelites (Odontobelus) mantanii sp. nov., holotype, YM-G-170816. 1, 2, 3. Ventral, left lateral (venter on left) and dorsal views, x1. 4. Transverse section at position indicated by anterior arrow in Fig. 1.3, venter down, x2. 5. Transverse section at position indicated by posterior arrow in Fig. 1.3, venter down, x2. 6. Partial enlargement of apex, showing longitudinal striae, dorsal view, x3.

Type species.-Belemnites oxyconus von Zieten, 1831, p. 27, pl. 21, fig. 5; upper Lias (Early Jurassic) of Baden-Württemberg, southern Germany.

Subgenus Odontobelus Naef, 1922

Type species.–Belemnites pyramidalis von Zieten, 1831, p. 31, pl. 24, fig. 5; upper Lias of Baden-Württemberg, southern Germany.

Range.-Lower Toarcian (Harpoceras falciferum ammonoid Zone, upper Lower Jurassic) to lower Aalenian (Leioceras opalinum ammonoid Zone, lower Middle Jurassic; Riegraf, 1980; Doyle, 1990).

Acrocoelites (Odontobelus) mantanii sp. nov. Fig. 1

Acrocoelites sp., Kameya and Niko, 1995, p. 37, fig. 2-1a-d.

Diagnosis.-Large species of Acrocoelites (Odontobelus) with nearly cylindriconical rostrum, moderately robust; outline symmetrical, weakly subhastate; profile slightly asymmetrical, cylindriconical; apex obtuse, longitudinally striated; apical region has tri-lobated transverse sections; one ventral and two dorsolateral apical grooves are present; ventral apical groove deeply and broadly incised.

Description.-A single available specimen is designated the holotype, that represents large sized, probably gerontic, nearly cylindriconical rostrum consisting apical and imperfect stem regions, very robust for the genus, moderately robust for the subgenus. It has 73.6 mm in total preserved length, 16.0 mm in maximum dorsoventral diameter. Outline symmetrical, weakly subhastate with approximately 30° in apical angle. Profile slightly asymmetrical, cylindriconical with approximately 27° in apical angle; ventral side of rostrum being inflated to a slightly greater degree than dorsal counterpart, and slightly displaced apex toward dorsal side. Apex obtuse, lacks mucronation. Apical region is approximately 23.5 mm in length, subconical with tri-lobated transverse sections. Stem region is long, at least 50.1 mm in length, nearly cylindrical with subcircular to rounded suboctagonal transverse sections. Alveolar region not preserved. Form ratios (lateral diameter per dorsoventral diameter) of rostrum decrease anteriorly, range from 0.99 to 1.09. Three well-defined apical grooves are present, namely one ventral and two dorsolateral; ventral apical groove deeply and broadly incised for the subgenus; dorsolateral apical grooves less incised than the ventral one. Lateral line and epirostrum not observable. Apex has very weak longitudinal striae. Apical line central in apical region, then shifts venter, probably goniolineate.

Etymology.-Named in honor of Mrs. Keiko Takafuji, *nee* Mantani, and Dr. Akio Mantani, who collected the holotype.

Material examined.-Holotype, YM-G-170816, deposited in the geological collections of the Yamaguchi Museum.

Discussion.-This species was preliminarily reported by Kameya and Niko (1995) as Acrocoelites sp. Our subsequent investigations reveal that it is best referred to Acrocoelites (Odontobelus), following the criteria of Doyle (1990), including 1) rostrum is very robust for Acrocoelites, 2) weakly subhaståte outline, 3) apex obtuse, and 4) there are three welldefined grooves in apical region. In its gross rostrum shape, A. (O.) mantanii sp. nov. shows various degrees of similarity to A. (O.) subtricissus Kolb (1942, p. 160, pl. 11, figs. 6a,b, 7) from the upper Toarcian of Bayern, southern Germany and A. (O.) vulgaris (Young and Bird, 1822, p. 258, pl. 14, fig. 1) from the Toarcian of Yorkshire, Great Britain. Acrocoelites (Odontobelus) mantanii, however, has a deep and broad ventral apical groove, whereas those of the latter two species are less incised, and replaced by the fine striae in some cases, or rarely reduced. Judging from known range of Acrocoelites (Odontobelus) and its specific affinities, the age of A. (O.) mantanii is constricted as Toarcian.

According to Hirano's (1973) biostratigraphic scheme, the upper portion of Nb Member belongs to the early Toarcian *Dactylioceras helianthoides* ammonoid Zone. Although the stratigraphic location of A. (O.) *mantanii* is not entirely certain, the age given by belemnite is consistent with that given by ammonoids.

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